

Today's Wireless World – The Mobile Evolution and Revolution

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4G Americas Board of Governors

4G Americas will promote, facilitate and advocate for the deployment and adoption of the 3GPP family of mobile broadband technologies throughout the ecosystem – including networks, services, applications and wirelessly connected devices – in the Americas.



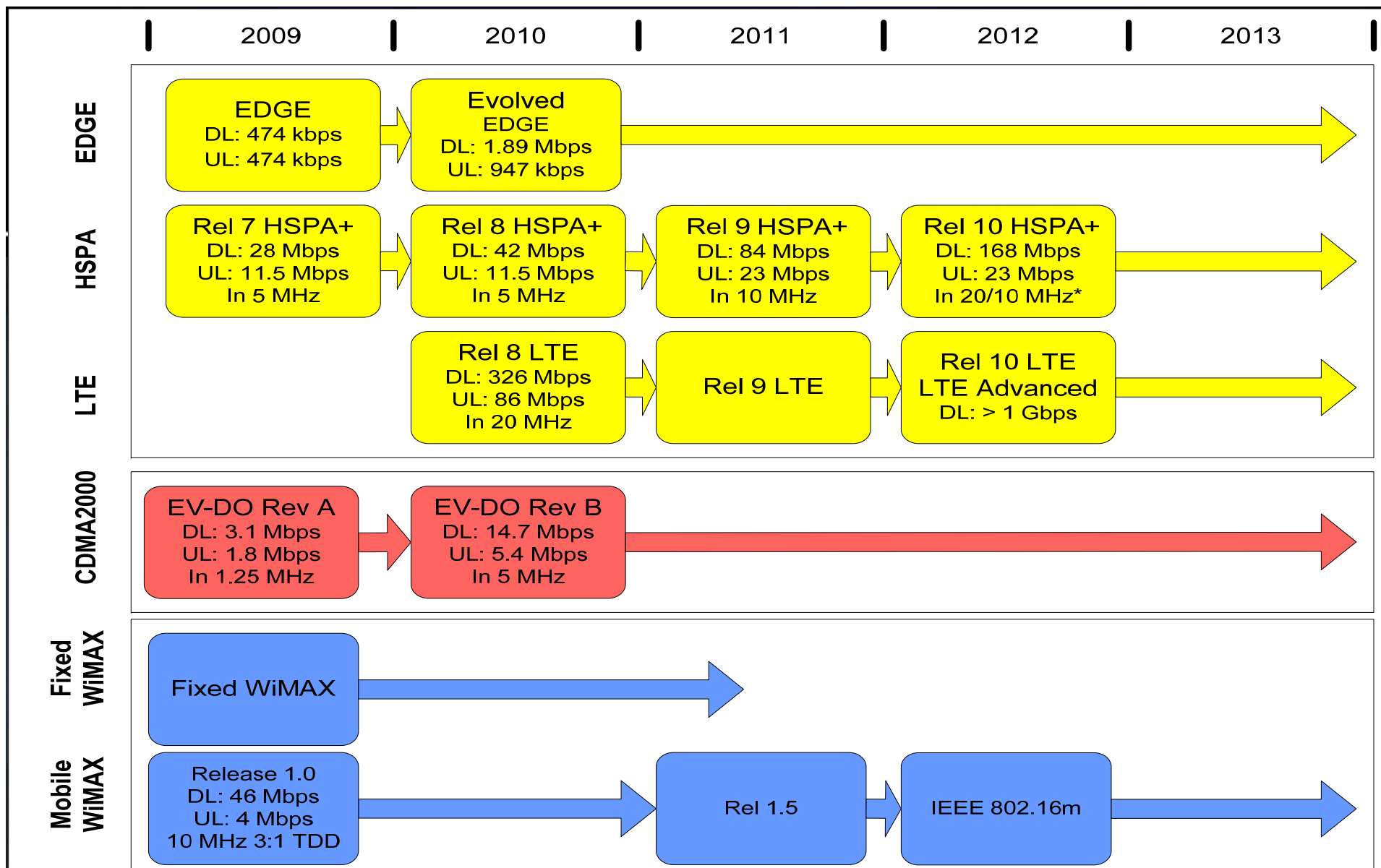
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Tsunami Alert: Mobile Broadband Demand

- Wireless Data ARPU in the U.S. exceeds 30% (CTIA)
- More than 1.5 billion devices that connect wirelessly to the Internet will be shipped over the next five years (Bernstein)
- Mobile broadband traffic will grow at a CAGR of 108 percent from 2009-2014 (Cisco)
- 50 billion connections by 2020 (Ericsson)

Demand Hurricane Alert: Mobile Broadband

- In 2011, smartphone sales will exceed feature phones (Morgan Stanley)
- Annual revenues from cloud-based mobile applications will reach nearly \$9.5 billion by 2014 (Juniper Research)
- Annual sales of smartphones will exceed PC's in 2012 (Morgan Stanley)
- 2010 will mark the first year when the total number of mobile broadband connections will exceed the total number of fixed broadband connections. (Chetan Sharma)



Throughput rates are peak theoretical network rates. Radio channel bandwidths indicated. Dates refer to expected initial commercial network deployment except 2009, which shows available technologies that year. There are no public announcements of deployment of WiMAX Rel 1.5.

* 20/10 MHz indicates 20 MHz used on the downlink and 10 MHz used on the uplink.

HSPA Data Rate Evolution

Technology

Future
HSPA+

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Combinations

HSPA+
(2x2 MIMO
Dual Carrier)

↓ 84 Mbps
(64 QAM)

↑ 23 Mbps
(16 QAM)

HSPA+
(2x2 MIMO)

↓ 42 Mbps
(64 QAM)

↑ 11.5 Mbps
(16 QAM)

HSPA+
(2x2 MIMO)

↓ 28 Mbps
(16 QAM)

↑ 11.5 Mbps
(16 QAM)

HSPA+

↓ 21.6 Mbps
(64 QAM)

↑ 11.5 Mbps
(16 QAM)

HSPA

↓ 14.4 Mbps

↑ 5.76 Mbps

HSPA

↓ 7.2 Mbps

↑ 5.76 Mbps

Downlink Speed Increase

100

50

0

Mbps

Higher Efficiency
Faster User Experience

Note: Throughput rates listed are Peak Theoretical

HSPA+ Has Gone Global

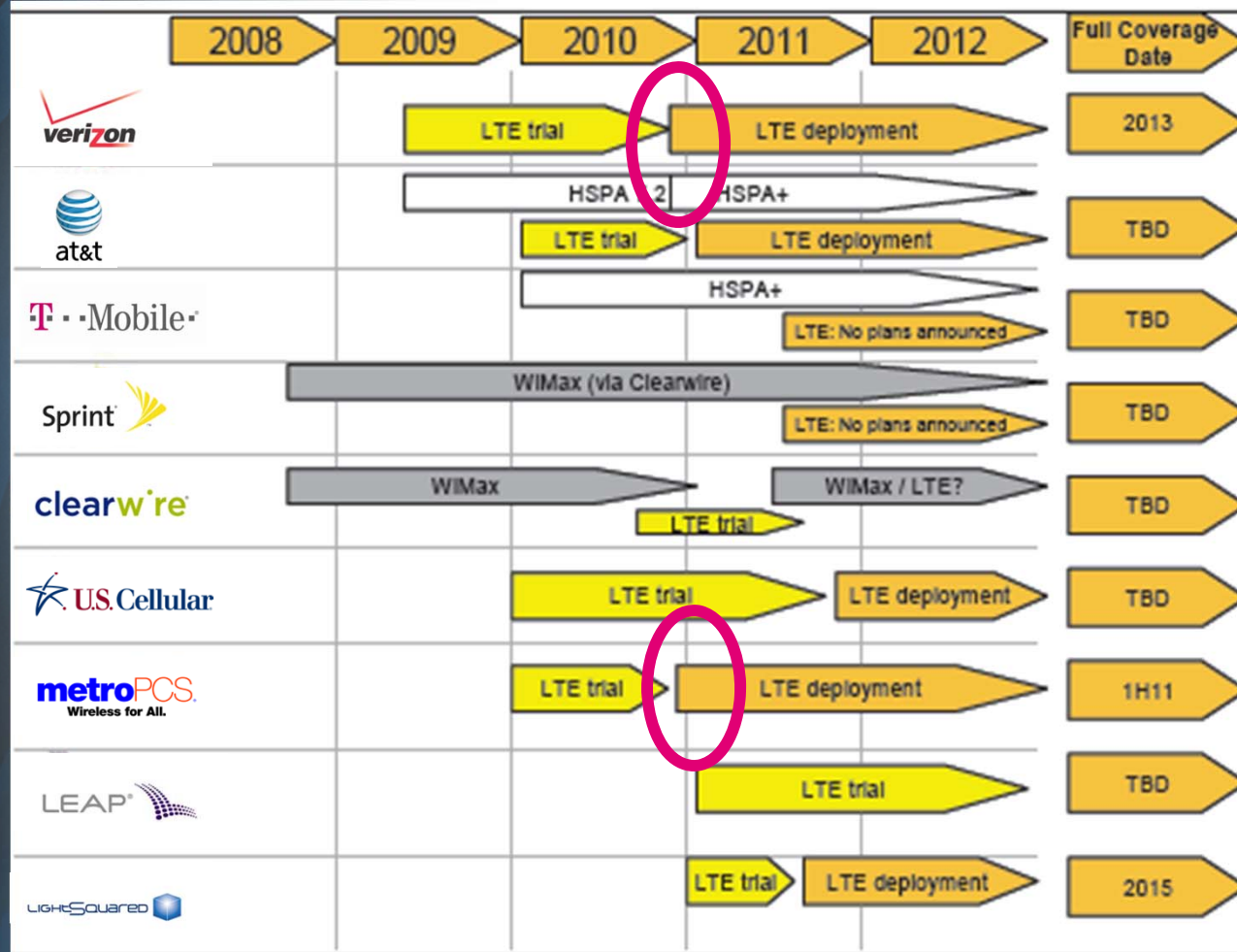
- 73 commercial HSPA+ networks in 37 countries*
- Majority of all HSPA networks expected to migrate to HSPA+
- A growing ecosystem of HSPA+ dongles and smartphones
- And closer to home . . .
 - AT&T upgrading its network to HSPA+ throughout the U.S.
 - T-Mobile currently at 115 Million POPs with HSPA+, with 200 Million planned by YE 2010
 - Ready for 42 Mbps in 2011



1st HSPA+
Smartphone

*Source: 4G Americas

2010: The Year LTE Makes Contact



Benefits of LTE

- ✓ Increased throughput & cell capacity
- ✓ Reduced latencies
- ✓ Full mobility
- ✓ Flat, IP-based architecture
- ✓ Scalable spectrum channels
- ✓ Backwards compatible
- ✓ QoS enhancements
- ✓ Interoperability with non-3GPP accesses

(Source: Morgan Stanley, September 2010)

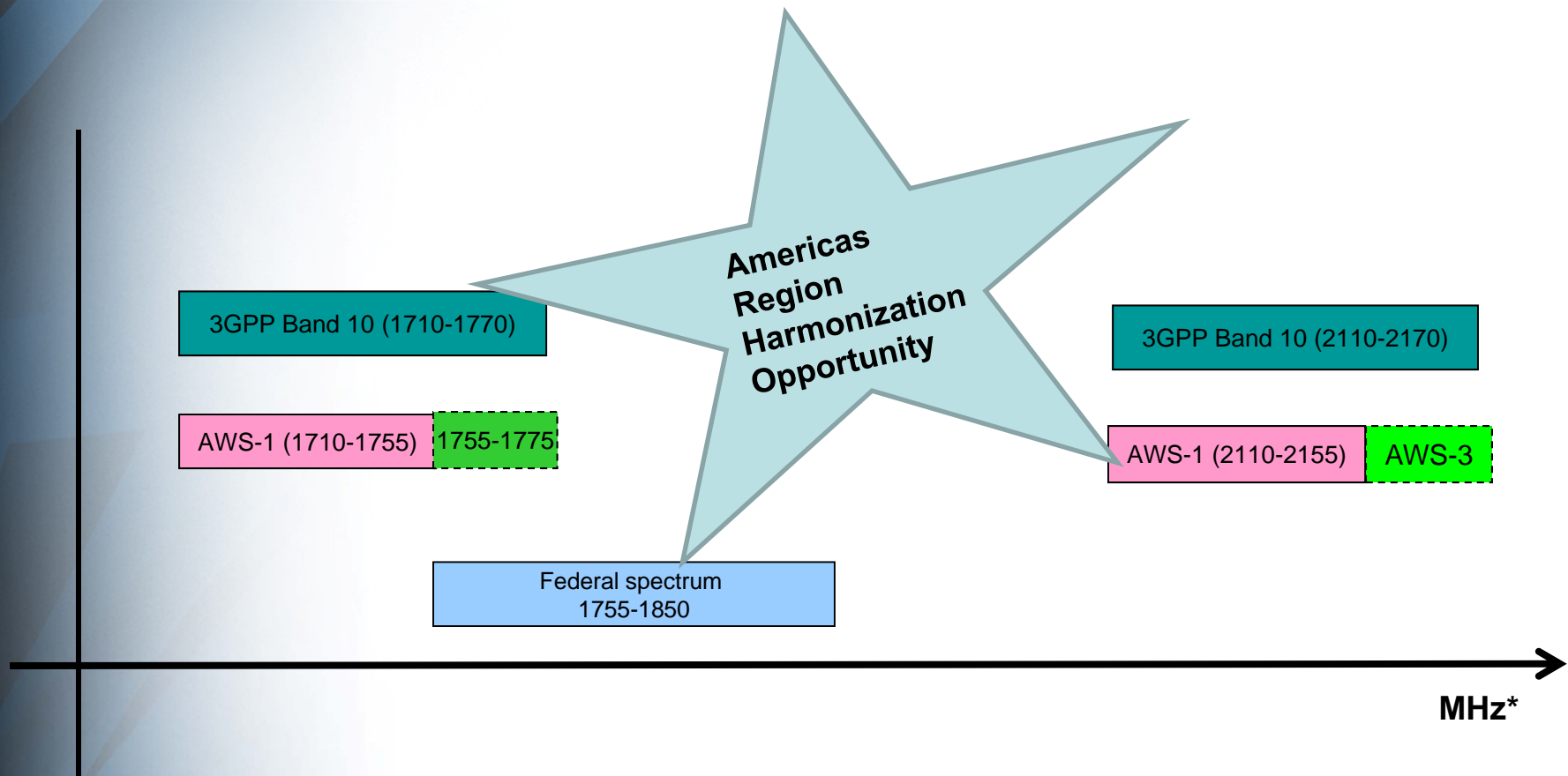
National Broadband Plan (NBP)

- Calls for 500 MHz additional spectrum for wireless broadband within next 10 years.
- 300 MHz of which between 225 MHz and 3.7 GHz available within 5 years.

Band	MHz
WCS	20
AWS 2/3	60
700 MHz D Block	10
Mobile Satellite Service	90
Broadcast TV	120
TOTAL	300

Optimized AWS-3 Allocation:

AWS-3 (1755-75 MHz) paired with 2155-75 MHz



**Not to Scale*

4G Americas stands ready to lend a hand.

Thank You.

